

CLAIMS

What is claimed is:

- 1 1. A method for delivering a melanocortin-4 receptor agonist
2 to a mammalian subject, comprising: administering an amount of the
3 melanocortin-4 receptor agonist to a tissue inside the nasal cavity or sinuses
4 of the mammalian subject, wherein the amount of the melanocortin-4 receptor
5 agonist administered to the tissue inside the nasal cavity or sinuses is at
6 least 1.5 times less than an amount required to achieve an equivalent effect
7 when administered orally.
- 1 2. The method of claim 1, wherein the melanocortin-4
2 receptor agonist comprises a guanidine group.
- 1 3. The method of claim 1, wherein the the melanocortin-4
2 receptor agonist has a molecular weight of less than 900 grams mole.
- 1 4. The method of claim 1, wherein the molecular weight of
2 the compound ranges from 450 grams per mole to 700 grams per mole.
- 1 5. The method of claim 1, wherein the melanocortin-4
2 receptor agonist comprises 3 or less amino acid residues.
- 1 6. The method of claim 1, wherein the melanocortin-4
2 receptor is not a peptide.
- 1 7. The method of claim 1, wherein the mammalian subject is
2 a human.
- 1 8. The method of claim 7, wherein the human has a
2 melanocortin-4 receptor mediated disease selected from obesity, an eating
3 disorder, or type II diabetes.

1 9. The method of claim 1, further comprising administering
2 the melanocortin-4 receptor agonist to the upper third of the nasal cavity.

1 10. The method of claim 9, wherein the melanocortin-4
2 receptor agonist is administered to the olfactory epithelium.

1 11. The method of claim 1, wherein the melanocortin-4
2 receptor agonist is administered as a powder or liquid nasal spray, as a
3 suspension, as nose drops, as a gel or ointment, through a tube or catheter,
4 by syringe, by packtail, by pledget, or by submucosal infusion.

1 12. The method of claim 1, wherein the melanocortin-4
2 receptor agonist is administered using an aerosol spray.

1 13. The method of claim 1, wherein the melanocortin-4
2 receptor agonist is administered as part of a pharmaceutical formulation that
3 comprises the melanocortin-4 receptor agonist and a carrier.

1 14. The method of claim 1, wherein the amount of the
2 melanocortin-4 receptor agonist administered to the tissue inside the nasal
3 cavity or sinuses is at least 2.5 times less than the amount required to achieve
4 the equivalent effect when administered orally.

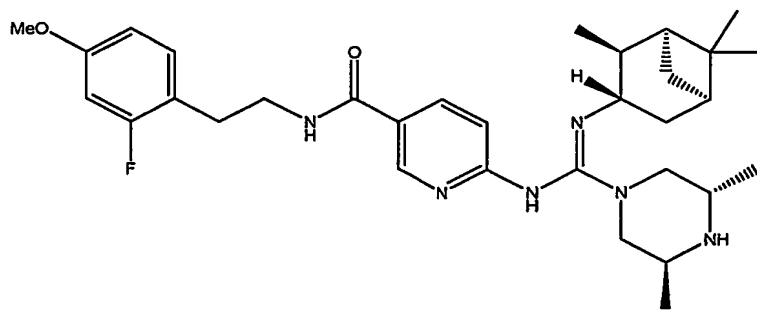
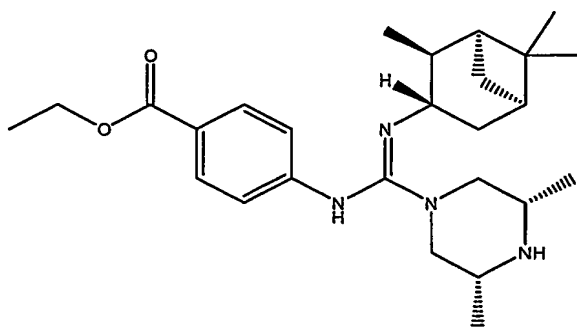
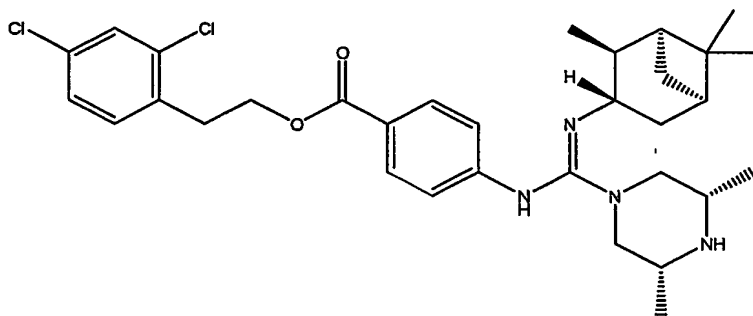
1 15. The method of claim 1, wherein the amount of the
2 melanocortin-4 receptor agonist administered to the tissue inside the nasal
3 cavity or sinuses is at least 4.0 times less than the amount required to achieve
4 the equivalent effect when administered orally.

1 16. The method of claim 1, wherein the amount of the
2 melanocortin-4 receptor agonist administered to the tissue inside the nasal
3 cavity or sinuses is at least 5.0 times less than the amount required to achieve
4 the equivalent effect when administered orally.

1 17. The method of claim 1, wherein the amount of the
2 melanocortin-4 receptor agonist administered to the tissue inside the nasal
3 cavity or sinuses is at least 10.0 times less than the amount required to
4 achieve the equivalent effect when administered orally.

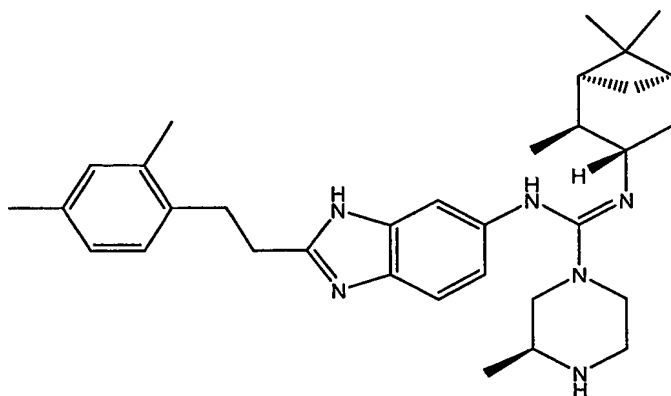
1 18. The method of claim 1, wherein the amount of the
2 melanocortin-4 receptor agonist administered to the tissue inside the nasal
3 cavity or sinuses is at least 12.0 times less than the amount required to
4 achieve the equivalent effect when administered orally.

1 19. The method of claim 1, wherein the melanocortin-4
2 receptor agonist is selected from

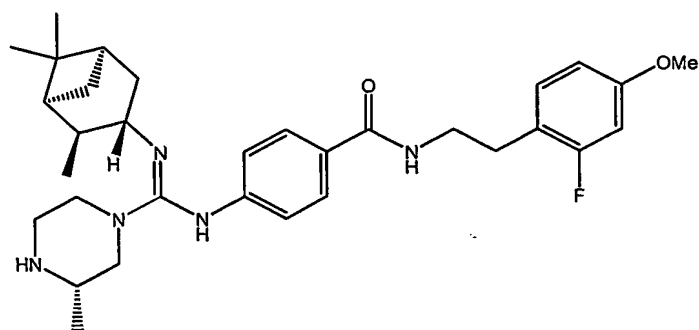


45

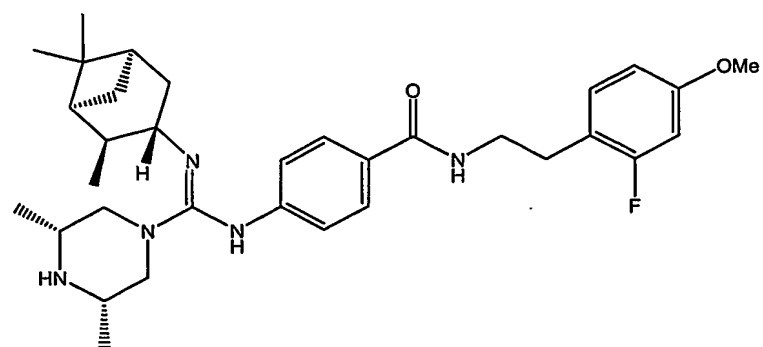
6



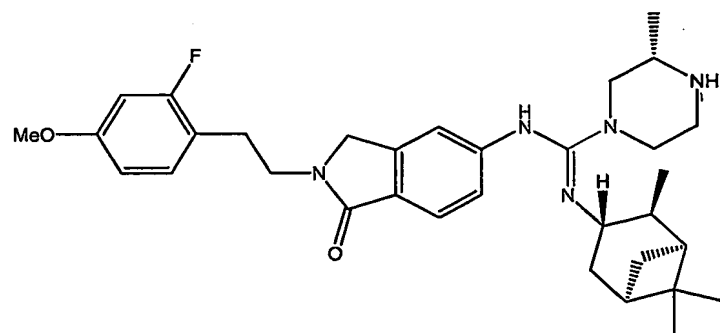
7



8

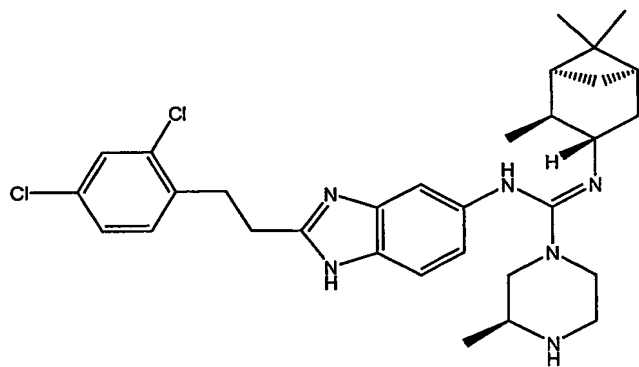


9

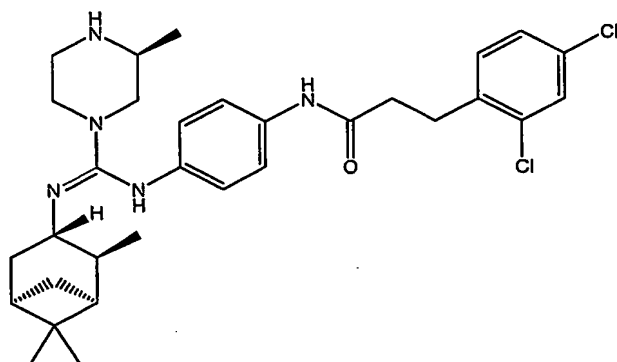


46

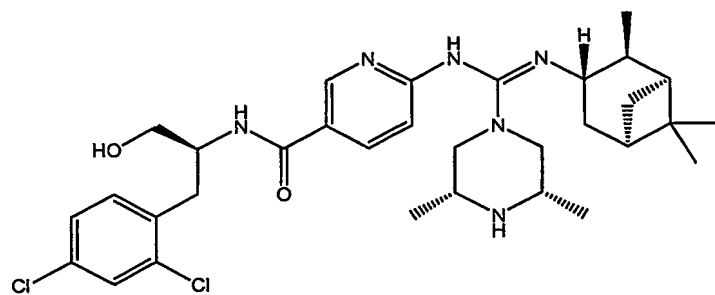
10



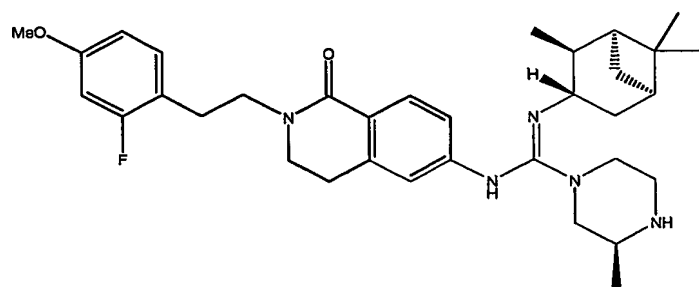
11



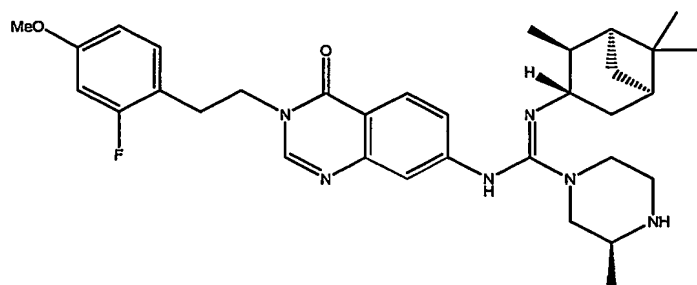
12



13

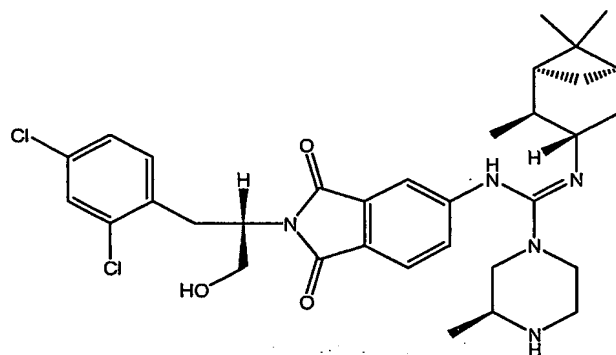


47



14

, or



15